

### **REMARKS**

By this amendment, Applicant has amended claims 1-3 and 5. Support for the amendments can be found in the Specification at, for example, page 6, line 9, to page 7, line 16; page 11, line 4 to page 12, line 6; and Figs. 1, 2, and 7. Claims 1-3 and 5-17 remain pending, of which claims 1-3 and 5 are under consideration and claims 6-17 are withdrawn from consideration.

In the Office Action<sup>1</sup>, the Examiner took the following actions:

- (a) rejected claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by Chen et al. (U.S. Patent Application Publication No. 2003/0087292, "Chen");
- (b) rejected claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Chen;
- (c) rejected claims 1, 2, and 5 under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Kobayashi et al. (U.S. Patent Application Publication No. 2003/0104709, "Kobayashi");
- (d) rejected claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Ootsubo et al. (U.S. Patent Application Publication No. 2003/0087297, "Ootsubo"); and
- (f) rejected claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Kobayashi and Ootsubo.

The Examiner also included a claim interpretation section at page 2 of the Office Action. Applicant does not concede the Examiner's statement in the claim interpretation section.

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<sup>1</sup> The Office Action contains statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement or characterization in the Office Action.

**Regarding the rejection under 35 U.S.C. § 102(b)**

Applicant respectfully traverses the rejection of claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by Chen.

In order to properly establish that Chen anticipates claims 1 and 2 under 35 U.S.C. § 102, each and every element of each of the claims in issue must be found, either expressly described or under principles of inherency, in that single reference. Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." See M.P.E.P. § 2131, quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, (Fed. Cir. 1989).

Chen fails to disclose each and every element of amended claim 1. For example, Chen does not disclose an electrode apparatus comprising:

a first electrode structure comprising: a well formed on a substrate; a first electrode under the well and providing a reaction area for performing the biochemical reaction; and a solid-phasing layer positioned on the first electrode;

a holder holding the first electrode structure; [and]

an external electrode structure disposed opposite to the first electrode structure, the external electrode structure comprising a semiconductor wafer formed at an end of the external electrode structure, the semiconductor wafer being a second electrode and having a surface facing the well, an area of the surface being larger than an opening area of the well,

as recited in claim 1 (emphasis added).

The Examiner asserted that Fig. 31 of Chen discloses the claimed elements of claim 1. See Office Action, page 3. This is not correct.

Chen discloses that

Another way to create more movement of the target molecules towards the probes on the substrate surface is to coat a layer of a conductor, such as metal, on a conventional substrate to serve as the lower electrode, as shown in FIG. 31. If the selected conductive layer is not compatible with the probe or target liquid, a thin biocompatible layer can be coated on top of the conductive layer to provide a base for probe bonding and target hybridization. The biocompatible layer can be, for example, silicon dioxide, silicon, or any other suitable material. Alternatively, a suitable conductive material can be used as the microarray substrate so that the substrate itself can be used as the lower electrode. Examples of such materials include p or n type doped silicon

Chen, paragraph [0186]. Chen further discloses upper electrode pads formed on a cover slip which is positioned above a substrate. See Chen, Fig. 31. However, Chen does not disclose that the upper electrode pads are a "semiconductor wafer formed at an end of the external electrode structure," as recited in amended claim 1 (emphasis added). Nor does Chen disclose that an area of an upper electrode pad is larger than an opening area of the space between the substrate and the cover slip. In fact, Chen discloses that an area of an upper electrode pad is smaller than an opening area of the space between the substrate and the cover slip. See Chen, Fig. 31. Thus, Chen cannot disclose "an area of the surface [of a semiconductor wafer] being larger than an opening area of [a] well," as recited in amended claim 1 (emphasis added).

Because Chen fails to disclose each and every element of claim 1, Chen cannot anticipate claim 1, and claim 1 is allowable. Claim 2 is also allowable at least due to its dependence from claim 1.

Accordingly, Applicant respectfully requests the Examiner to withdraw the rejection of claims 1 and 2 under § 102(b).

**Regarding the rejection of claim 5 under 35 U.S.C. § 103(a)**

Applicant respectfully traverses the rejection of claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Chen.

The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. Such an analysis should be made explicit and cannot be premised upon mere conclusory statements. M.P.E.P. § 2142, 8th Ed., 7 (July 2008). "A conclusion of obviousness requires that the reference(s) relied upon be enabling in that it put the public in possession of the claimed invention." M.P.E.P. § 2145. Furthermore, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art" at the time the invention was made. M.P.E.P. § 2143.01(III), internal citation omitted. Moreover, "[i]n determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences *themselves* would have been obvious, but whether the claimed invention *as a whole* would have been obvious." M.P.E.P. § 2141.02(I), internal citations omitted (emphasis in original).

"[T]he framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). ... The factual inquiries...[include determining the scope and content of the prior art and]...[a]scertaining the differences between the claimed invention and the prior art." M.P.E.P. § 2141(II). "Office personnel must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art." M.P.E.P. § 2141(III). Here, no *prima facie* case of obviousness has been

established, for at least the reason that the Office Action has failed to properly determine the scope and content of the prior art, and has failed to ascertain the differences between the prior art and the claimed combinations.

Claim 5 depends from and recites each and every element of claim 1. As discussed above, Chen does not disclose or suggest an electrode apparatus comprising

a first electrode structure comprising: a well formed on a substrate; a first electrode under the well and providing a reaction area for performing the biochemical reaction; and a solid-phasing layer positioned on the first electrode;

a holder holding the first electrode structure; [and]

an external electrode structure disposed opposite to the first electrode structure, the external electrode structure comprising a semiconductor wafer formed at an end of the external electrode structure, the semiconductor wafer being a second electrode and having a surface facing the well, an area of the surface being larger than an opening area of the well,

as recited in claim 1, and included in claim 5 (emphasis added).

In view of the above deficiencies, the Office Action has neither properly determined the scope and content of the prior art nor properly ascertained the differences between the prior art and claim 5. Accordingly, no reason has been clearly articulated as to why claim 5 would have been obvious to one of ordinary skill in the art in view of the prior art. Therefore, a *prima facie* case of obviousness has not been established for claim 5, and claim 5 is allowable.

Accordingly, Applicant respectfully requests the Examiner to withdraw the rejection of claim 5 under § 103(a).

**Regarding the rejection of claims 1, 2, and 5 under 35 U.S.C. § 103(a)**

Applicant respectfully traverses the rejection of claims 1, 2, and 5 under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Kobayashi.

As discussed above, Chen does not disclose or suggest

a first electrode structure comprising: a well formed on a substrate; a first electrode under the well and providing a reaction area for performing the biochemical reaction; and a solid-phasing layer positioned on the first electrode;

a holder holding the first electrode structure; [and]

an external electrode structure disposed opposite to the first electrode structure, the external electrode structure comprising a semiconductor wafer formed at an end of the external electrode structure, the semiconductor wafer being a second electrode and having a surface facing the well, an area of the surface being larger than an opening area of the well,

as recited in claim 1 (emphasis added).

Kobayashi fails to cure the deficiencies of Chen. The Examiner asserted that "Kobayashi discloses silicon wafers (semiconductors) are generally mirror polished (see [0073])." Office Action, page 4. Even assuming the Examiner's characterization of Kobayashi is correct, which Applicant does not concede, Kobayashi still fails to disclose or suggest the above-quoted elements recited in claim 1.

In view of the above deficiencies, the Office Action has neither properly determined the scope and content of the prior art nor properly ascertained the differences between the prior art and claim 1. Accordingly, no reason has been clearly articulated as to why claim 1 would have been obvious to one of ordinary skill in the art in view of the prior art. Therefore, a *prima facie* case of obviousness has not been established for claim 1, and claim 1 is allowable.

Claims 2 and 5 are also allowable at least due to their dependence from claim 1.

Accordingly, Applicant respectfully requests the Examiner to withdraw the rejection of claims 1, 2, and 5 under § 103(a).

**Regarding the rejections of claim 3 under 35 U.S.C. § 103(a)**

Applicant respectfully traverses the rejections of claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Ootsubo, and Chen in view of Kobayashi and Ootsubo.

Claim 3 depends from and includes each and every element of claim 1. As discussed above, Chen and Kobayashi, taken alone or in combination, do not disclose or suggest

a first electrode structure comprising: a well formed on a substrate; a first electrode under the well and providing a reaction area for performing the biochemical reaction; and a solid-phasing layer positioned on the first electrode;

a holder holding the first electrode structure; [and]

an external electrode structure disposed opposite to the first electrode structure, the external electrode structure comprising a semiconductor wafer formed at an end of the external electrode structure, the semiconductor wafer being a second electrode and having a surface facing the well, an area of the surface being larger than an opening area of the well,

as recited in claim 1, and included in claim 3 (emphasis added).

Ootsubo fails to cure the deficiencies of Chen and Kobayashi. The Examiner asserted that “Ootsubo is similarly directed to an electrode device with multiple electrodes which is used to analyze hydridization reactions (see [0016]). Ootsubo further discloses that voltage applied from a voltage source may be DC or AC voltage.”

Office Action, pages 5 and 6. Even assuming the Examiner's characterization of

Ootsubo is correct, which Applicant does not concede, Ootsubo still fails to disclose or suggest the above-quoted elements recited in claim 1, and included in claim 3.

In view of the above deficiencies, the Office Action has neither properly determined the scope and content of the prior art nor properly ascertained the differences between the prior art and claim 3. Accordingly, no reason has been clearly articulated as to why claim 3 would have been obvious to one of ordinary skill in the art in view of the prior art. Therefore, a *prima facie* case of obviousness has not been established for claim 3, and claim 3 is allowable.

Accordingly, Applicant respectfully requests the Examiner to withdraw the rejections of claim 3 under § 103(a).

In view of the foregoing remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account no. 06-0916.

Respectfully submitted,

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